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Headquarters Engineering Branch, RECD/

Report on Environmental Conditions, Broyhill Building

Survey Conducted 12 April 1972

1. Purpose - Based on a brief survey this report discusses the environmental conditions that presently exist in the Broyhill Building basement and first floor office areas.

2. Description of HVAC Systems - The heating and cooling systems for the entire building consist of one centralized chiller, a boiler also located in the basement, and a cooling tower or towers on the building roof. The central plant supplies chilled or hot water to four air handlers which provide conditioned and fresh air to the subject space. The first floor exterior offices are cooled or heated by a perimeter system which consists of two pipe fan-coil units.

3. Present Situation - The environmental problems and equipment deficiencies with the system that serves the subject areas are as follows:

a. Inadequate and unreliable cooling during the cooling cycle. This is due to the deplorable condition of each air handling apparatus. The coils and blower vanes are dirty, and controls and dampers are inoperative.

b. The first floor perimeter fan-coil units are not providing the maximum design cooling capacity due to dirty coils, etc.

c. High humidity and temperature in the basement area is detrimental to the operational equipment and storage material. This is due to the prime chilled water shut down on weekends and holidays.

d. Improperly located thermostats and malfunction of damper controls has resulted in unsatisfactory ambient conditions during operational periods.

e. Air distribution is considered unsatisfactory to a degree when filtered air is required in specific areas. From all indications the ducts are dirty and as a result personnel have blocked the air supply at diffusers so not to affect the film developing operation.

4. Recommended Corrective Action - As a result of the brief survey three plans varying in reliability and cost are presented for consideration. In the review and evaluation of these recommendations and in the selection of the best approach, management must weigh the cost for improving the existing systems, new equipment and systems, or complete relocation of the activities.

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a. Plan No. 1 - The installation of a two compressor packaged chiller with air cooled condenser. This system would be connected to the existing hot and chilled water (HCW) loop which serves the first floor perimeter fan-coils, and four air handlers. In addition, if the existing air handlers are beyond repair, they should be replaced. Possible chiller location would be in the existing mechanical room and condenser could be installed near the stair well. It should be noted that the HCW loop also serves the entire first floor area.

b. Plan No. 2 - Replace existing air handlers in basement area with direct expansion type unit and with outdoor condensing units.

c. Plan No. 3 - Relocate the existing activity to a more desirable facility if the above recommendations cannot be implemented.

5. Conclusion - The environmental problems in this facility are typical of any two pipe conditioned air systems which provide no flexibility for cooling and/or heating during abnormal outdoor temperatures. The system deficiencies listed above are not to be construed as final. Because of locked equipment rooms, two air handlers were not inspected. From all indications, the condition of these units would be similar to the units that were inspected. The HCW piping should be inspected for restrictions and water flow capacity. For immediate relief and to minimize the existing problems, it is mandatory that prompt action be taken to correct all deficiencies.

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